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FEDERAL-STATE COOPERATIVE SNOW SURVEYS and IRRIGATION WATER FORECASTS

for
COLORADO RIVER DRAINAGE BASIN

March 1, 1948

by
Division of Irrigation, Soil Conservation Service
United States Department of Agriculture
and
Colorado Agricultural Experiment Station

Small amounts of the reports were obtained by the agencies named above in cooperation with the U.S. Forest Service, National Park Service, State Engineers of Colorado, Wyoming and New Mexico and several irrigation organizations.

WATER SUPPLY OUTLOOK
COLORADO RIVER DRAINAGE

March 1, 1949

Snow accumulation on the headwaters of the Colorado River in Wyoming, Colorado and New Mexico has been much above average to March 1. Snowfall has been heaviest in Southwestern Colorado, about 50 percent above normal for this date. Relatively less snow has occurred in the Upper Colorado River and other tributaries. Valley areas are snow covered at high and medium elevations in Colorado and Wyoming. Soil moisture conditions are described as good to excellent throughout the basin.

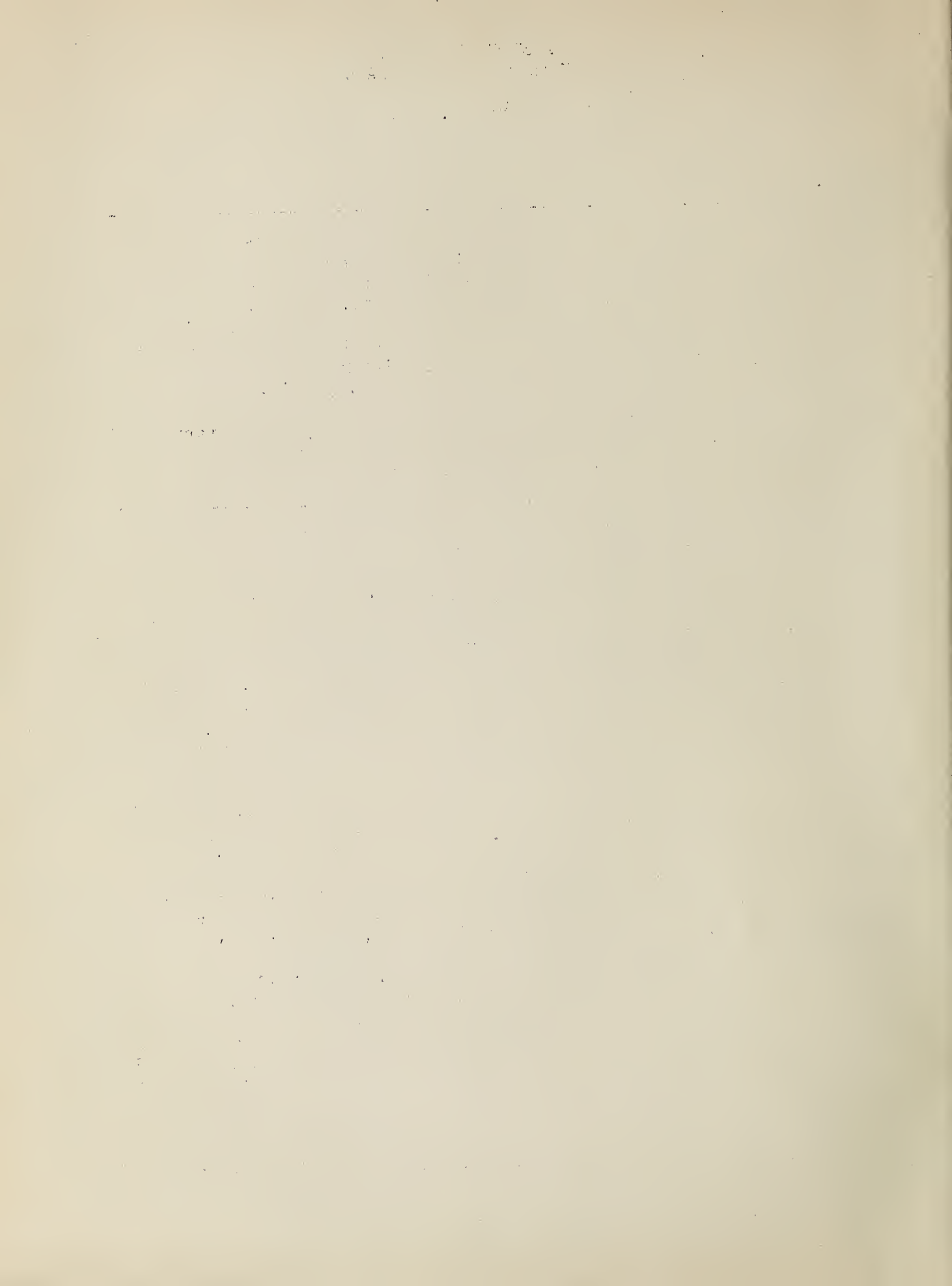
The highest snow cover since snow surveys were started in 1938 remains on most courses in Arizona. Streamflow has been high but recent precipitation in valley areas has been below normal.

COLORADO RIVER AND TRIBUTARIES
IN COLORADO

Colorado River (above Grand Junction): The snow cover on the Colorado River watershed above Grand Junction is 22 percent over normal and 15 percent above a year ago. The distribution of snow on the watershed indicates that normal snow cover exists on the Blue, Fraser and Roaring Fork Rivers and considerably above normal on other tributaries in Colorado. Storage in Green Mountain Reservoir is 64,500 acre-feet, as compared to 74,500 a year ago. February precipitation was generally deficient but soil moisture conditions are described as good to excellent.

Gunnison River: The snow cover on the Gunnison River is similar to the Colorado River main stem. Average snow-water content is 20 percent above normal and 22 percent higher than last year. Seasonal precipitation in valley areas has been well above average and soil is saturated. Snow is gone from valley areas but covers the low hills. Storage in Taylor Park Reservoir is now 63,000 acre-feet. On March 1, 1948 the reservoir contained 89,000 acre-feet.

Yampa and White Rivers: Snow-water content measured on the headwaters of the Yampa River is 34 percent above normal. Valley areas are snow covered. Seasonal precipitation has been much above average. On the White River watershed the February increase in snow cover was substantially above normal and the current average is 33 percent over the past average for March 1 and 42 percent over last year.



San Juan and Animas Rivers: Seasonal snowfall to date has been very high at all elevations in the San Juan Basin. Average snow-water content is 26 percent above last year at this time when the snow cover was also unusually heavy. The heavy snow cover extends into the San Juan drainage basin in New Mexico. On the Animas River the average snow-water content is 50 percent above normal. Storage in Vallecito Reservoir is now 55,000 acre-feet as compared to 57,000 on February 1, and 66,000 a year ago. Electra Lake now has in storage 11,500 acre-feet. Streamflow has been below normal due to the extreme cold and soil moisture conditions are reported as excellent.

Dolores River: On the headwaters of the Dolores and San Miguel Rivers the snow cover is 67 percent above normal and is relatively higher than for other streams in Colorado. Streamflow has been low. Soil moisture in the Cortez area is reported as very good. Range conditions are only fair. Storage in Groundhog Reservoir is down from a year ago.

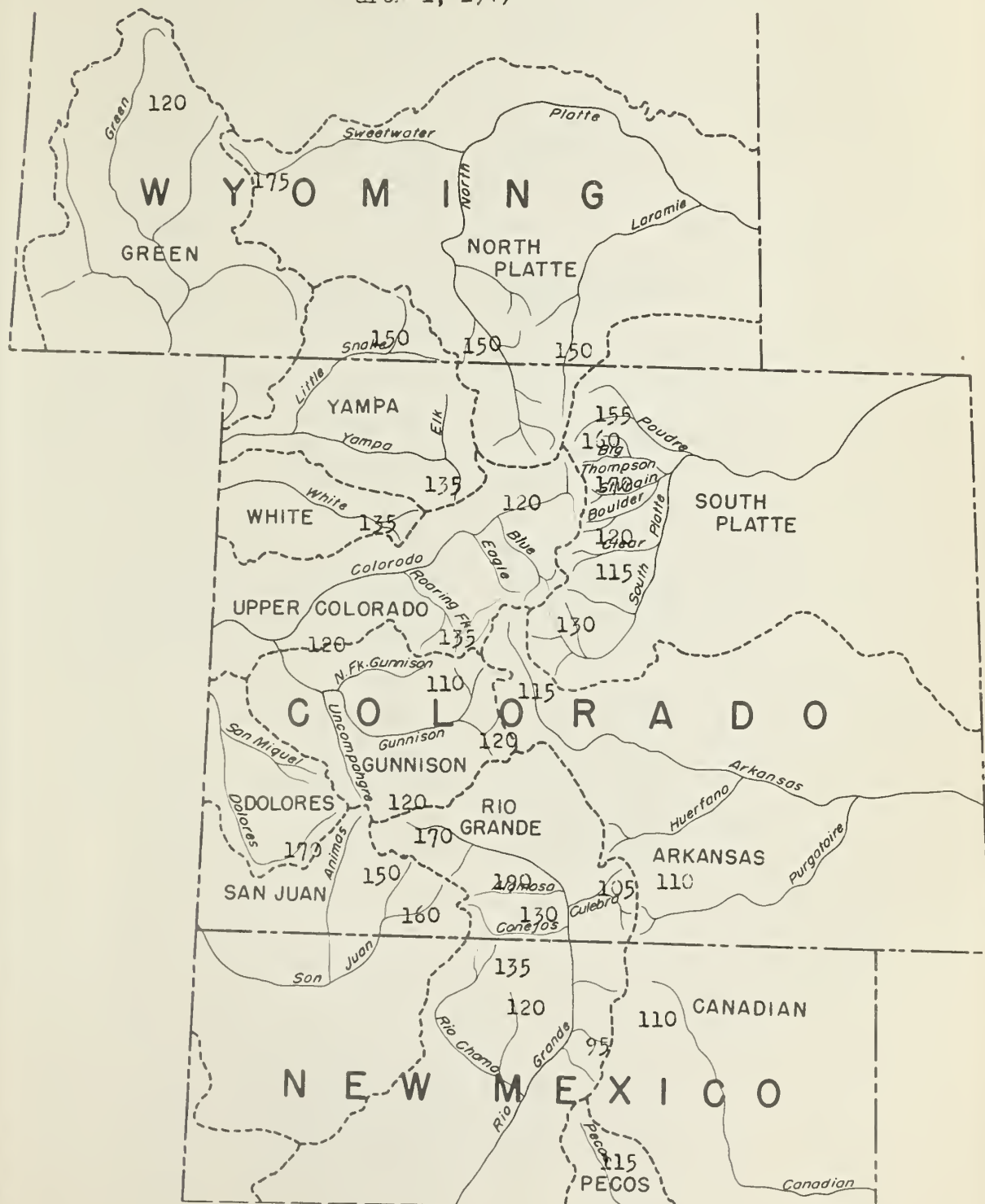
GREEN RIVER IN WYOMING

From limited snow surveys on the Green River in Wyoming March 1, the snow-water content is 29 percent above average and 60 percent above last year at this time. Winter precipitation in valley areas has been well above normal. The range is reported as dry due to lack of snow melt.

COLORADO RIVER AND TRIBUTARIES IN ARIZONA

The water supply outlook for Arizona continues to be much improved after a drought covering three seasons. The snow at practically all courses is heavier than any time since snow surveys were started in 1938. On some low courses the water stored in the snow is slightly less than on February 1 and February 15. Streamflow has been high and reservoirs are filling rapidly. The soil is saturated at higher valley elevations but is drying in the southern low areas due to lack of recent precipitation. Southern ranges were also in need of moisture to support growth.

In Percent of Normal
March 1, 1949



SNOW SURVEYS AND IRRIGATION WATER FORECASTS

COLORADO RIVER BASIN

STATUS OF RESERVOIR STORAGE, MARCH 1, 1949

BASIN AND STREAM	RESERVOIR	USABLE CAPACITY (THOUS. A.Ft.)	THOUSANDS ACRE FEET IN STORAGE ABOUT February 1			
			1949	1948	1947	1946 10-Year Av. 1938-1947*
COLORADO DRAINAGE						
Taylor River	Taylor Park	106.2	63.4	89.1	68.4	83.4
Los Pinos River	Vallecito	126.3	54.9	65.9	58.3	38.7
Groundhog Creek	Groundhog	21.7	6.0	11.0	8.0	8.5
Blue River	Green Mountain	146.9	65.4	74.5	74.7	66.8
Colorado River	Lake Mead	27935.0	18197.0	19148.0	16692.0	18275.0
Colorado River	Lake Havasu	688.0	574.1	591.0	609.7	588.4
SALT AND GILA DRAINAGE						
Salt River	Roosevelt	1420.0	223.5	30.6	133.6	433.8
"	Horse Mesa	245.0	112.1	161.9	229.0	224.3
"	Mormon Flat	58.0	27.3	25.8	39.0	31.4
"	Stewart Mt.	70.0	27.3	13.1	28.1	10.8
Verde River	Bartlett	179.5	83.4	8.3	11.3	1.8
Aqua Fria River	Carl Pleasant	173.0	24.7	9.5	3.0	3.6
Gila River	San Carlos	1200.0	162.0**	1.3	18.3	29.9
Verde River	Horseshoe	67.0	35.6			

*Some for shorter periods

**Net storage, Feb. 15, 1949.

SNOW SURVEYS AND IRRIGATION WATER FORECASTS for

COLORADO RIVER BASIN

March 1, 1949

SUMMARY OF FEBRUARY 1 SNOW SURVEYS AND COMPARISON OF DATA WITH THAT OF PREVIOUS YEARS BY WATERSHEDS

WATERSHEDS	Snow Depth		Water Content		Number Courses in Average	Snow Density		1948 Water Content in percent of	
	Thirteen year Avg.*	1948	Thirteen year Avg.*	1949		Thirteen year Avg.*	1948	Thirteen year Avg.*	1948
	In.	In.	In.	In.		Percent	Percent	Percent	Percent
COLORADO RIVER									
Green River	36.5	32.7	45.8	10.1	4	28	25	129	159
Colorado River**	42.8	47.4	44.4	11.1	24	26	25	122	115
Roaring Fork	38.3	43.2	40.2	9.6	3	25	23	118	113
Yampa River	55.6	58.7	60.6	16.0	5	29	28	134	129
White River	47.2	50.8	50.6	13.4	2	28	25	133	142
Gunnison River	46.6	47.9	49.0	12.6	10	27	26	120	122
Dolores River	34.3	--	44.2	8.4	4	24	--	167	--
San Juan River	41.3	54.9	58.8	11.7	7	28	27	161	126
Animas River	32.9	45.0	43.3	8.4	3	25	25	148	112
Gila River	8.5	18.4	20.2	2.2	6	26	21	318	184
Salt River	7.3	11.8	16.5	2.0	5	27	20	285	238
Verde River***			29.7	1.2	7				
Little Colo. River	6.8	10.9	14.6	1.8	3	26	20	294	240
Williams River***			18.2	0.2	2				

Above Grand Junction *Some for shorter periods. *Three Year Record.

P R E C I P I T A T I O N D A T A

WATERSHED	STATE	Precipitation*		Departure from Normal		Precipitation*		Departure from Normal	
		October 1 to February 28		Inches		February		Inches	
		Inches		Inches		Inches		Inches	
Colorado	Colorado	8.87		+1.50		1.37		-0.28	
Green	Wyoming	4.39		+0.77		0.52		-0.19	
San Juan	New Mexico	5.37		+0.87		0.72		-0.22	
Colorado	Arizona	8.23		+1.33		1.25		-0.44	
Gila	Arizona	8.38		+1.47		0.64		-0.98	

COLORADO RIVER DRAINAGE SNOW SURVEYS
March 1, 1949

Drainage Basin and Snow Course	Location			Snow Cover Measurements									
	No. and State	Sec.	Twp.	Range	Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches)			Yrs. of Rec.	Past Record Av. Water Content (Inches)	
								1949	1948	1947			
COLORADO RIVER													
Cameron Pass*	1 Colo.	2	6N	76W	10300	3/5	50.3	19.6	15.4	17.9	12	15.7	
Park View*	7 "	24	5N	78W	9200	2/28	39.7	11.8	7.1	9.1	13	7.2	
Phantom Valley	12 "	7	5N	75W	9300	2/28	36.6	10.8	9.4	8.4	13	8.3	
Hoosier Pass	14 "	13	8S	78W	11400	2/28	38.5	9.3	9.2	7.8	12	8.2	
Berthoud Pass	16 "	35	2S	75W	9700	3/1	48.8	12.0	12.9	11.8	13	12.4	
Tennessee Pass	19 "	21	8S	80W	10200	2/27	36.7	6.2	7.7	8.1	13	7.3	
Ind. Pass Tunnel	33 "	30	11S	82W	10200	2/28	48.4	13.4	13.8	17.4	13	13.3	
N. Lost Trail Cr.	34 "	20	11S	87W	9200	2/28	44.8	14.3	11.6	10.8	13	10.2	
M. Fork Camp Cr.	37 "	16	3S	77W	9000	2/28	32.2	9.4	5.8	7.5	13	7.8	
Fiddler Gulch	44 "	1	8S	80W	11000	3/1	52.3	15.0	12.8	14.0	13	11.9	
Nast	45 "	1	9S	83W	8700	3/2	27.5	6.3	4.7	5.2	13	5.4	
Mesa Lakes	56 "	35	11S	96W	10000	2/3	44.2	14.6	15.7	13.5	12	13.2	
Lulu	59 "	25	6N	76W	10200	2/27	51.9	16.2	10.9	13.7	11	13.2	
Willow Creek P.	62 "	1	4N	78W	9500	2/28	48.0	15.7	10.0	12.0	11	9.2	
N. Inlet Grand L.	64 "	26	4N	75W	9000	2/25	29.5	7.9	10.1	8.8	11	7.3	
Lake Irene	65 "	8	5N	75W	10600	2/27	66.7	26.1	19.5	13.4	11	15.7	
Thunderbolt Peak	66 "	22	2N	74W	9500	2/28	47.0	17.8	16.5	15.8	11	13.1	
Arrow	69 "	34	1S	75W	9900	2/25	33.5	8.2	9.1	8.9	11	7.8	
Lapland	70 "	16	2S	76W	9300	2/28	38.2	10.5	8.5	9.9	9	8.6	
Fremont Pass #2	79 "	2	8S	79W	11400	2/25	47.3	12.8	13.6	13.4	13	12.0	
Trickle Divide	85 "	23	11S	94W	1000	3/3	67.0	24.6	19.7	24.5	9	20.9	
Lynx Pass	91 "	27	2N	83W	9100	2/28	43.9	13.0	13.3	10.2	13	10.6	
Shrine Pass	96 "	15	6S	79W	10500	2/25	45.3	12.9	14.7	13.7	7	12.9	
Grizzly Peak	97 "	2	5S	76W	11250	2/28	48.6	14.6	12.5	15.0	7	13.1	
Ivanhoe	100 "	12	9S	82W	10400	3/1	56.1	16.5	--	16.9	3	--	
Glen-Mar Ranch	102 "	31	12S	77W	8850	2/28	34.4	10.3	5.6	8.8	2	7.2	
Monarch Lake	106 "	30	2N	94W	8500	3/1	40.2	11.1	14.7	--	1	--	
Granby	113 "	11	2N	77W	8700	2/25	31.3	6.5	6.5	--			
Grand Lake	127 "	36	4N	75W	8600	2/28	36.2	10.0	13.5	12.1		11.1	
Average for Drainage							44.4	13.5	11.8	12.1			

*On adjacent drainage

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COLORADO RIVER SNOW SURVEYS, March 1, 1949

Drainage Basin and Snow Course		No. and State		Location		Range	Elev.	Date of Survey	Snow Depth (Inches)	Snow Cover Measurements			
				Sec.	Twp.					Water Content (Inches)		Past Record	
YAMPA RIVER													
Dry Lake	6	Colo.	26	7N	84W	8200	3/1	54.0	19.9	14.8	12.0	10	14.9
Columbine Lodge	8	"	21	5N	82W	9300	3/1	64.0	19.8	18.0	17.8	13	17.8
Elk River	9	"	6	10N	85W	8700	2/28	51.3	18.3	14.2	14.8	10	12.8
Lynx Pass	91	"	27	2N	83W	9100	2/28	43.9	13.0	13.3	10.2	13	10.6
Old Battle	9	Wyo.	29	14N	85W	9800	2/28	89.9	36.1	22.9	32.7	12	24.1
				Average for drainage				60.6	21.4	16.6	17.5		16.0
WHITE RIVER													
Burro Mountain	35	Colo.	15	2S	91W	9000	2/28	50.8	18.5	14.3	14.9	13	14.8
Rio Blanco	36	"	28	1N	88W	8500	3/1	50.4	17.1	11.0	14.2	10	11.9
				Average for drainage				50.6	17.8	12.6	14.6		13.4
ROARING FORK													
Ind. Pass Tunnel	33	Colo.	30	11S	82W	10200	2/28	48.4	13.4	13.8	17.4	13	13.3
N. Lost Trail Cr.	34	"	20	11S	87W	9200	2/28	44.8	14.3	11.6	10.8	13	10.2
Nast	45	"	1	9S	83W	8700	3/2	27.5	6.3	4.7	5.2	13	5.4
Ivanhoe	100	"	12	9S	82W	10400	3/1	56.1	16.5	---	16.9	3	---
				Average for drainage				40.2	11.3	10.0	11.1		9.6
GUNNISON RIVER													
Crested Butte	18	Colo.	22	13S	86W	9000	3/1	42.7	11.8	10.9	10.2	13	11.4
Marshall Creek	42	"	24	48N	6E	10800	2/27	47.4	13.5	9.6	8.5	13	9.7
Poncha Creek*	43	"	19	48N	7E	10500	2/27	37.0	10.8	9.2	6.0	13	8.0
Park Cone	46	"	19	14S	82W	9700	2/28	40.5	11.4	8.2	7.4	12	7.2
Alexander Lake	53	"	2	12S	25W	10000	3/2	61.8	19.4	17.5	21.0	12	17.6
Snowshoe Mesa	55	"	14	13S	89W	7500	2/28	30.7	8.8	6.0	6.5	12	7.7
Ironton Park	58	"	29	43N	7W	9800	2/28	47.6	13.3	11.3	11.3	12	11.0
Trickle Divide	85	"	23	11S	94W	10000	3/3	67.0	24.6	19.7	24.5	9	20.9
Park Reservoir	87	"	34	11S	94W	9500	3/3	63.5	22.4	19.0	24.0	9	19.7
Porphyry Creek	89	"	19	49N	6E	10800	2/28	51.7	14.8	12.7	11.1	8	12.5
Kannah Creek	101	"	5	12S	95W	10700	2/3	62.0	21.3	22.7	19.7	1	6.9
Lake City	104	"	13	43N	4W	10300	2/28	32.7	7.4	6.9	---		
Spring Cr. Pass	123	"	2	42N	3W	10900							
Cochetopa Pass	126	"	12	45N	3E	1000	3/2	30.1	6.8	12.4	13.0		12.6
				Average for Drainage				19.0	15.1				

* on adjacent drainage

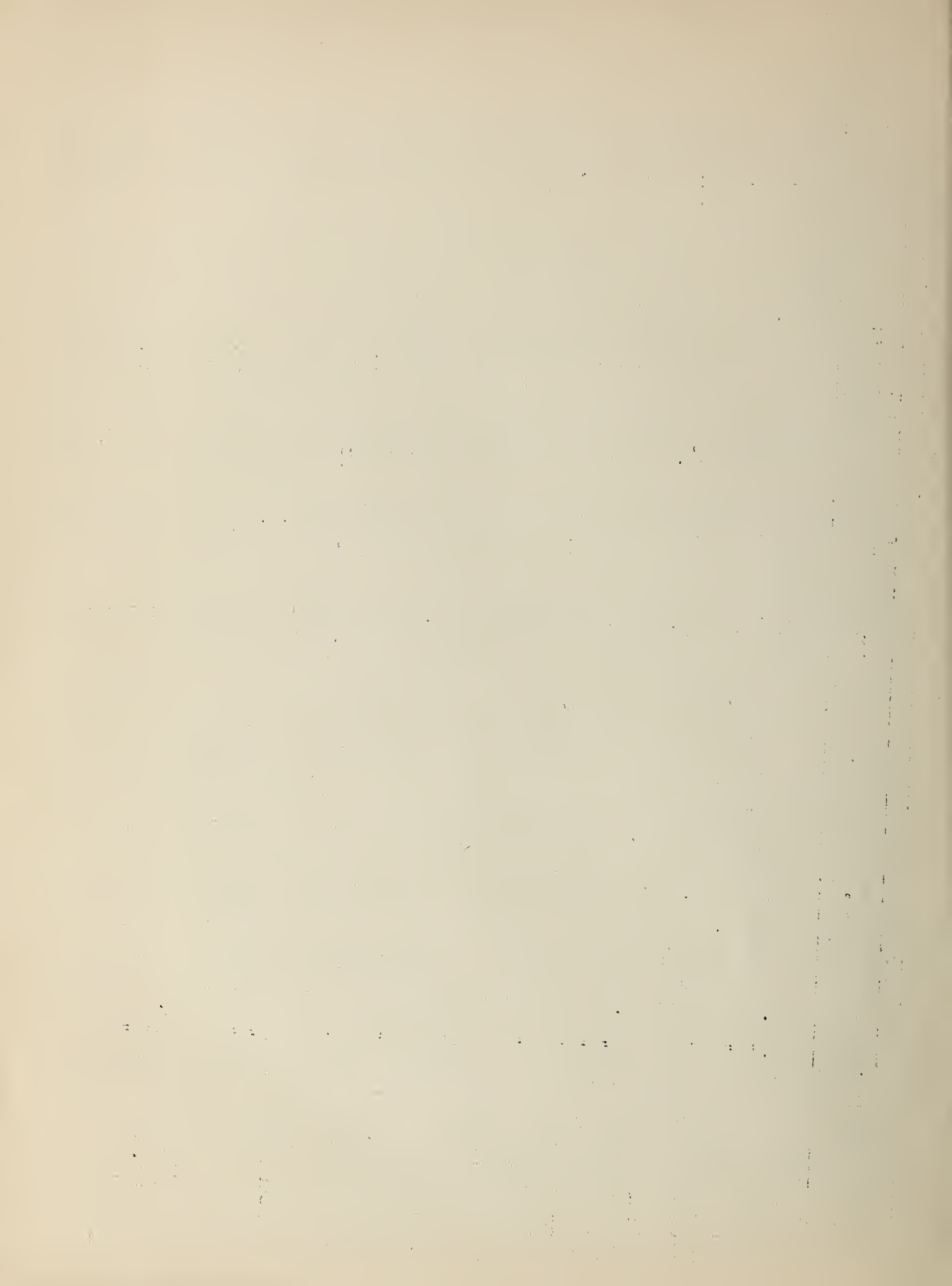
COLORADO RIVER SNOW SURVEYS, March 1, 1949

Drainage Basin and Snow Course	No. and State	LOCATION				Date of Survey	Snow Depth (Inches)	SNOW COURSE MEASUREMENTS				Past Record (Inches)
		Sec.	Twp.	Range	Elev.			Water Content (Inches)				
								1949	1948	1947	Yrs. of Record	
COLORADO RIVER												
SAN JUAN RIVER								In.	In.	In.		
Wolf Creek Pass*	26 Colo.	4	37N	2E	10000	2/28	102.2	35.4	27.7	20.0	12	22.1
Upper San Juan	29 "	10	37N	1E	10000	2/28	116.9	40.1	32.4	21.6	11	24.1
Silverton Sub.S.	30 "	10	41N	7W	9400	2/28	23.7	6.1	5.3	5.2	10	4.6
Cascade	31 "	12	39N	9W	8850	2/28	58.9	17.7	16.5	9.0	10	9.6
Granite Peaks	93 "	24	37N	6W	7950	2/28	43.2	10.6	9.6	0.6	8	7.6
Chama Divide	17 N.Mex.		36.9N	106.7W	7750	3/4	26.2	8.2	4.8	4.2	9	5.2
Chamita*	18 "		36.9N	106.7W	8500	3/3	40.6	13.3	7.8	8.8	8	8.9
			Average for Drainage				58.8	18.8	14.9	9.9		11.7
ANIMAS RIVER												
Silverton Sub.S.	30 Colo.	10	41N	7W	9400	2/28	23.7	6.1	5.3	5.2	10	4.6
Cascade	31 "	12	39N	9N	8850	2/28	58.9	17.7	16.5	9.0	10	9.6
Ironton Park*	58 "	29	43N	7W	8700	2/28	47.6	13.3	11.3	11.3	12	11.0
			Average for Drainage				43.4	12.4	11.0	8.5		8.4
DOLORES RIVER												
Rico	23 Colo.	11	39N	11W	8700	3/1	33.0	10.8	--	4.1	10	5.4
Telluride	24 "	6	42N	8W	8600	2/28	36.2	9.2	7.6	6.3	10	6.8
Lizard Head	25 "	24	41N	10W	10300	2/28	59.7	23.5	--	13.4	10	11.7
Lone Cone	90 "	23	41N	13W	8900	2/28	48.0	12.4	8.1	7.8	8	9.7
Trout Lake	114 "	8	41N	9W	9700	2/27	54.9	14.7	--	--	--	--
			Average for Drainage				44.2	14.0	--	7.9		8.4
GILA RIVER												
Frisco Divide	11 N.Mex.	21	6S	20W	8000	2/28	15.6	5.4	4.7	0.0	11	2.2
State Line	14 "	6	6W	21W	8000	2/28	20.4	7.1	3.7	0.0	11	2.4
Taylor Creek	22 "	20	10S	10W	7850	3/1	5.3	1.8	1.8	0.0	7	0.3
Inman	23 "	6	11S	10W	7800	3/1	4.3	1.6	1.8	0.0	3	0.6
Nutriso	3 Ariz.	23	6N	30E	8500	2/28	23.7	7.7	3.4	0.0	11	2.0
Beaver Head	4 "	13	4N	30E	8000	3/1	24.7	9.3	5.0	0.0	10	3.0
Coronado Trail	5 "	26	5N	30E	8000	2/28	31.5	10.4	4.1	0.0	11	3.3
Rose Canyon	Ariz.	15	12S	16E	7300	3/1	0.0	0.0	2.6			
Bear Wallow	"	6	12S	16E	8100	3/1	21.3	7.1	3.1	0.0		
			Average for Drainage				20.2	7.0	3.8	0.0		2.2

*On adjacent drainage

COLORADO RIVER SNO. SURVEYS, March 1, 1949

Drainage Basin and Snow Course	Location			Range	Elev.	Date of Survey	Snow Depth (Inches)	Snow Course Measurements		
	No. and State	Sec.	Twp.					Water Content (Inches)	Yrs. of Record	Past Record (Inches)
COLORADO RIVER										
SALT RIVER	6 Ariz.	14	8N	23E	7200	3/1	14.1	5.8	10	2.4
McNary	7 "	2	9N	21E	6000	3/1	5.9	2.3	10	1.1
Forestdale	9 "	28	8N	23E	7000	3/1	7.2	2.5	7	1.1
Nutriosos*	3 "	23	6N	30E	8500	2/28	23.7	7.7	11	2.0
Coronado Trail*	5 "	26	5N	30E	8000	2/28	31.5	10.4	11	3.3
			Average for drainage				16.5	5.7		2.0
VERDE RIVER										
Iron Springs*	11 Ariz.	22	14N	3W	6200	2/26	20.8	7.8	3	0.3
Camp Wood	12 "	3	16N	6W	5700	3/1	15.7	5.5	3	0
Mingus Mountain	"	3	15N	2E	7100	3/2	17.3	7.8	2	0.7
Mormon Lake*	"	13	18N	8E	7350	3/1	59.9	21.2	2	4.1
Fort Valley*	"	22	22N	6E	7350	3/1	31.5	9.9	2	0.5
Chalender*	"	27	22N	3E	7100	3/1	33.2	11.0	2	1.8
			Average for Drainage				29.7	10.5		1.2
LITTLE COLORADO RIVER										
Forest Dale*	7 Ariz.	2	9N	21E	6000	3/1	5.9	2.3	10	1.1
McNary	6 "	14	8N	23E	7200	3/1	14.1	5.8	10	2.4
Nutriosos*	3 "	23	6N	30E	8500	2/28	23.7	7.7	11	2.0
Mormon Lake	"	13	18N	8E	7350	3/1	59.9	21.2	2	4.1
Fort Valley	"	22	22N	6E	7350	3/1	31.5	9.9	2	0.5
Bright Angel	Ariz.	34	33N	3E	8400	3/1	49.3	14.0	1	--
Grand Canyon	Ariz.	21	30N	4E	7500	3/1	24.0	8.2	1	--
			Average for Drainage				14.6	5.3		1.8
WILLIAMS RIVER										
Iron Springs	11 Ariz.	22	14N	3W	6200	2/26	20.8	7.8	3	0.3
Camp Wood*	12 "	3	16N	6W	5700	3/1	15.7	5.5	2	0
Willow Ranch	"	16	21N	11W	5000			6.6	2	0
			Average for Drainage				18.2	1.3		0.2
GREEN RIVER										
Mulligan Park	24 Wyo.	17	35N	108W	8900	2/27	42.8	10.6	7	8.9
Kendall R.S.	25 "	23	38N	110W	7900	2/27	44.3	12.5	7	9.6
Loomis Park	26 "	14	37N	111W	8500	2/28	55.0	17.6	7	13.1
East Rim Divide	44 "	32	37N	111W	7950	3/4	41.0	11.4	7	8.9
							45.8	13.0		10.1



The following organizations cooperate in the snow surveys and irrigation water supply forecasts for the Colorado, Blackfoot-Arkansas and Rio Grande watersheds by furnishing funds or services:

STATES

Colorado State Engineer
Wyoming State Engineer
Utah State Engineer
New Mexico State Engineer
Montana State Engineer
Nebraska State Engineer
Colorado Experiment Station
Colorado Extension Service
Montana Experiment Station
Utah Experiment Station

FEDERAL

Department of Agriculture
Forest Service
Soil Conservation Service
Department of Interior
Bureau of Reclamation
Geological Survey
National Park Service
Department of Commerce
Weather Bureau
War Department
Army Engineer Corps

UTILITY UTILITIES

Colorado Public Service Company
Northern Colorado Power Company
Montana Power Company
Public Service Company of New Mexico
Denver and Rio Grande Northern R. R. Company

MUNICIPALITIES

City of Indian
City of Denver
City of Boulder

LOCAL ORGANIZATIONS

Frontier Valley Water Users' Association
Arapahoe Valley Water Association
Colorado River Water Conservation District

IRRIGATION DISTRICTS

Paterson Reservoir and Irrigation Company
San Luis Valley Irrigation District
Santa Rita Reservoir Company
Castille Land Company
Unorganized Valley Water Users' Association
Wyoming Development Company
Spoken Irrigation District
Kendrick Project
Foothill Irrigation District
Bell River Valley Water Users' Association
San Carlos Irrigation and Drainage District
San Luis Reservoir and Canal Company

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